Cell-free DNA testing in twins: application in a tertiary private University Hospital

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Objective

The objective of this presentation is to describe the application of cell-free DNA (cfDNA) testing in twins in our population, based in a contingent model of first trimester screening for trisomies 21, 13 and 18.

Methods

We retrospectively analysed all cases of twin pregnancy in which cfDNA testing has been performed. First trimester combined testing (maternal age + nuchal translucency + free-βHCG + PAPP-A) is performed in all cases. The cfDNA test is offered as an option to all patients with an intermediate risk result (1/30 to 1/1000) and is also carried out at the request of the parents. In this study, we analysed the median fetal fraction obtained, failure rate, turnaround rate, indication for the test and correspondence with neonatal outcomes.

Results

A total of 77 cell-free DNA tests were performed in twins at our center (HarmonyTM Prenatal Test, Ariosa Diagnostics, Inc., San Jose, CA, USA and NIDA, Genyca Genetics, Madrid, Spain). The average maternal age was 38.4 years, median BMI 23.5 and 74% of the pregnancies were conceived by in vitro fertilization. The median fetal fraction obtained was 11.1%, with a failure rate of 1.3% (1/77). The average delay for obtaining the result was 10.3 days. The main indications for the test was an intermediate risk in the combined first trimester test (56.6%) and maternal anxiety (43.4%). All cases with an intermediate risk result are encouraged to do cfDNA testing, but only 31.1% accepted the test. In our series, one high risk result for trisomy 13 was obtained, which was confirmed by karyotyping. No high risk results for trisomy 21 or 18 were found. Neither false positive nor false negative results were encountered in this series.

Conclusion

CfDNA testing in twins showed satisfactory results in our population despite the low rate of acceptance in the intermediate risk group (31%), mainly due to economic reasons. Failure rates in previous studies rise up to 9.4%, but in our study it is significantly lower (1.3%). One explanation could be that mean gestational age at the time of extraction was 13.8 weeks (vs 11.7). Fetal fraction is also significantly higher despite similar BMI and higher rate of IVF in our series, probably due to the same fact. The main limitation of our data is the low number of aneuploidies obtained. Further studies need to be done to firmly integrate cfDNA testing in first trimester screening in twins.

Results of cfDNA testing in 77 twin pregnancies.

	Median	Standard deviation	Median
Maternal age	38,43	3,68	39,00
Gestational age in weeks	13,88	2,04	13,30
BMI	23,50	3,46	23,77
CRL	61,14	6,89	60,50
Log PAPP-A	0,59	0,66	0,63
Log Hcg	0,66	0,57	0,69
Combined screening 1/30 – 1/1000	43		
Combined screening >1/1000	34		
Spontaneous conception	20		
ART	57		
Failed result	1		
Fetal fraction %	11,08	3,14	10,65
Days to result	10,32	12,43	11
High risk result	1		
Low risk result	76		